

CLAIMS

What Is Claimed Is:

1. An elastomeric sleeve and retainer assembly for insertion through a hole in a panel for receiving a fastener to secure the fastener to the panel, comprising;
a retainer member;
an elastomeric sleeve attached to the retainer member; and
an expander member attached to the elastomeric sleeve whereby when a fastener engages the retainer member to draw it toward an interior surface of the panel the expander member expands to prevent withdrawal of the retainer member through the hole.
2. The elastomeric sleeve and retainer assembly of Claim 1 wherein the elastomeric sleeve is a flexible sleeve that can collapse during assembly to seal the retainer assembly to the panel.
3. The elastomeric sleeve and retainer assembly of Claim 1 wherein the elastomeric sleeve is a moldable rubber.
4. The elastomeric sleeve and retainer assembly of Claim 1 further including a sleeve spacer attached to the elastomeric sleeve for securing the elastomeric sleeve in the hole.
5. The elastomeric sleeve and retainer assembly of Claim 1 wherein the expander member is of a split-ring configuration with a first part formed integral with a nut member and a second part held adjacent to the first part by the elastomeric sleeve.
6. The elastomeric sleeve and retainer assembly of Claim 1 wherein the expander member is of split-ring configuration with an opening on one side and a pivotable portion on an opposite side.
7. The elastomeric sleeve and retainer assembly of Claim 1 wherein the elastomeric sleeve is a hollow tube with an exterior conical opening and having an internal surface of a configuration to support the retainer member and expander member.

8. An expanding panel fastener assembly for affixing a honeycomb panel structure to a support structure comprising:

an insert member of a configuration to attach to a honeycomb panel through a hole in the honeycomb panel;

a flexible sleeve and retainer assembly of a configuration to extend through the insert member and support structure and to have a portion retained by the insert member including a flexible sleeve, an expander member and a nut member; and

a fastener member of a configuration to extend through the flexible sleeve and support structure and to operatively engage the nut member,

whereby tightening of the fastener member relative to the nut member expands the expander member to prevent withdrawal of the nut member and expands the flexible sleeve to provide a sealing configuration with the support structure.

9. The expanding panel fastener assembly of Claim 8 wherein the flexible sleeve is an elongated tube with the expander member and nut member at one end of the elongated tube and the insert member contacting the other end of the elongated tube, an intermediate portion of the elongated tube is flexible to accommodate alignment with a support structure.

10. The expander panel fastener assembly of Claim 9 further including a sleeve spacer mounted within the elongated tube.

11. The expanding panel fastener assembly of Claim 10 wherein the expander member is of a split-ring configuration with a first part formed integral with a nut member and a second part held adjacent to the first part by the elastomeric sleeve.

12. The expanding panel fastener assembly of Claim 10 wherein the expander member is of split-ring configuration with an opening on one side and a pivotable portion on an opposite side.

13. The expanding panel fastener assembly of Claim 10 wherein the elongated tube is a moldable rubber with an exterior conical opening at the one end surrounding the sleeve spacer and an internal surface of a configuration to integrally support the expander member and retainer member at the other end.

14. A method of fastening an aircraft panel structure to a support structure in an aircraft comprising the steps of:

providing an opening in a panel structure;

fastening an insert member in the panel opening;

fixedly inserting a flexible sleeve and retainer assembly through the insert member, the flexible sleeve and retainer assembly including a flexible sleeve, an expander member and a retainer member;

aligning the panel and flexible sleeve and retainer assembly with a support structure having a complimentary opening for receiving the flexible sleeve and retainer assembly; and

inserting a fastener member through the flexible sleeve and the support structure opening to operatively engage the retainer member and to expand the expander member whereby the panel structure is attached to the support structure.

15. The method of Claim 14 wherein the operative engagement of the fastener member with the retainer member further compresses the flexible sleeve to seal against the support structure.